B

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,089	07/08/2003	Xin Jin	H10230/CFR	8689

1333 7590 01/12/2006

BETH READ
PATENT LEGAL STAFF
EASTMAN KODAK COMPANY
343 STATE STREET
ROCHESTER, NY 14650-2201

EXAMINER	
DOTE, JANIS L	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 01/12/2006

C

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/615,089	JIN ET AL.	
	Examiner	Art Unit	
	Janis L. Dote	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-86* is/are pending in the application.

4a) Of the above claim(s) *1-13,15,26,40-51,53 and 63* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14,16-25,27-39,52,54-62,64-80 and 83-86* is/are rejected.

7)☒ Claim(s) *81 and 82* is/are objected to.

8)☒ Claim(s) *1-86* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/6/04;1/31/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Applicant's election without traverse of the invention of Group II, claims 14, 16-39, 52, and 54-86, in the reply filed on Oct. 24, 2005, is acknowledged.

2. The examiner also acknowledges applicants' elected species, which is the "polymer described in Example 7 which is obtained by reacting DAAS and MATMS with methyltrimethoxysilane." The specification identifies DAAS as di-p-anisyl aminostyrene and MATMS as methacryloxypropyl trimethoxysilane. See example 7 at page 37, lines 1-2. Methyltrimethoxysilane is the additional silane monomer having at least one hydrolyzsable group.

Applicants state that claims 14, 16-39, 52, and 54-86 read on the elected species. However, the examiner has determined that claims 26 and 63 do not read on the elected species for the following reasons:

Claims 26 and 63 require that the index c be 2 in the formula recited in instant claims 16 and 54, from which claims 26 and 63, respectively, depend. However, in the vinyl substituted silane monomer MATMS, the index c is 3.

Accordingly, Claims 1-13, 15, 26, 40-51, 53, and 63 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention and nonelected species of invention, there being no allowable generic or

linking claim. Election was made **without** traverse in the reply filed on Oct. 24, 2005.

3. The reference, "SANCHEZ et al. J Mater. Chem. 1999, Vol. 9, page 35," which is listed on the form PTO-1449 in the information disclosure statement (IDS) filed on Dec. 8, 2004, has been crossed-out by the examiner, because pages 38, 40, and 41 of the document are not legible. 37 CFR 1.98(a)(2)(ii) requires that a legible of copy of each publication or portion which caused it to be listed other than U.S. patents and U.S. patent application publications unless required by the Office. Accordingly, the reference has been placed in the application file, but the information referred to therein has not been considered as to the merits.

Applicants are advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

4. The disclosure is objected to because of the following informalities:

(1) The specification at page 4, lines 11-14, discloses that the teachings in copending US patent application serial no. 09/818,956 are incorporated by reference in their entity. However, the specification fails to identify the current status of the US application.

(2) The use of trademarks, e.g., Ludox [sic: LUDOX] at page 24, line 23, has been noted in this application. The trademarks should be capitalized wherever they appear and be accompanied by the generic terminology. This example is not exhaustive. Applicants should review the entire specification for compliance.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Appropriate correction is required.

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37

CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

(1) In claims 31 and 69, the recitation "R^1 is an aliphatic, cycloaliphatic, or aromatic group containing 1 to about 12 carbon atoms" lacks antecedent basis in the specification. See page 23, lines 19-20, of the specification, which discloses that "R^1 is an aliphatic, cycloaliphatic, or aromatic group containing up to about 18 carbon atoms."

(2) In claims 32 and 70, the recitation "alkyls containing 1 to about 12 carbon atoms, fluoroalkyl containing 1 to about 12 carbon atoms" lacks antecedent basis in the specification. See page 23, line 23, of the specification, which discloses that R^1 can be an alkyl or a fluoroalkyl "containing up to about 18 carbon atoms."

(3) The recitations in claims 36-39 lack antecedent basis in the specification. See page 10, lines 9-10, of the specification, which reads "the condensed reaction product, from a polar solvent medium (such as a mixture of water and an alcohol as exemplified hereinafter)." The specification at page 10 does not disclose that the condensed reaction product is a silsesquioxane as recited in instant claims 36-39. Nor does the specification at page 10 disclose the polar solvent broadly

recited in instant claims 37 and 38. Nor does the specification at page 10, disclose the solvents recited in instant claim 39.

(4) In claim 77, the recitation "polar solvent comprises water" lacks antecedent basis in the specification. See page 10, lines 9-10, of the specification, which discloses that "the condensed reaction product, from a polar solvent medium (such as a mixture of water and an alcohol as exemplified hereinafter)." The phrase "polar solvent comprises water" is broader than the polar solvent medium disclosed in the specification, because it encompasses polar solvent mediums that do not contain an alcohol.

(5) In claim 78, the recitation "polar solvent further comprises a water-miscible organic solvent" lacks antecedent basis in the specification. See page 10, lines 9-10, of the specification, which discloses that "the condensed reaction product, from a polar solvent medium (such as a mixture of water and an alcohol as exemplified hereinafter)." The term "water-miscible organic solvent" is broader than the term "an alcohol" disclosed in the specification, because it encompasses solvents that are not alcohols, such as methyl isobutyl ketone.

(6) In claim 79, the recited Markush group lacks antecedent basis in the specification. See page 10, lines 9-10, of the specification.

(7) The recitations in claims 80-82 lack antecedent basis in the specification.

(8) In claim 83, the recitation "barrier layer overlying said electrically conducting layer" (emphasis added) lacks antecedent in the specification. See page 28, lines 19-20, of the specification, which merely discloses that the electrophotographic element may comprise a barrier layer. The specification does not disclose the location of the barrier layer as recited in instant claim 83.

(9) The recitations in claims 84-86 lack antecedent basis in the specification. See page 11, lines 7-13, of the specification, which discloses that "overcoats comprising the silsesquioxanes of the invention" have the thickness recited in instant claims 84 and 85, not the first charge transport layer comprising the condensed reaction product of the charge transport polymer recited in instant claim 54. The specification also discloses that a primary charge transport layer comprising the silsesquioxane of the invention has a thickness as recited in instant claim 86, not a charge transport layer comprising the condensed reaction product of the charge transport polymer recited in instant claim 54.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 14, 19, 21, 22, 52, 58, 59, and 74 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 14 and 52 are indefinite in the phrase "[a] silsesquioxane comprising the polymer of claim 1 [claim 52: 40]" because it is not clear how the silsesquioxanes can comprise polymers of claims 1 or 40 when the instant specification discloses that the silsesquioxane is obtained by the condensation reaction of such polymers.

Claims 19 and 74 are indefinite for improper Markush language. The claims are missing the conjugation "and" between the chemical formulas CTM XXI and CTM XXII. Proper Markush language is "R is selected from the group consisting of . . . and . . ." or "R is . . . or . . ." MPEP 2173.05(h). As written, it is not clear whether the grouping is closed.

Claims 21, 22, 58, and 59 are indefinite in the phrase "selected from the group consisting of an ester residue -COO- or

-OCO- . . . or mixtures thereof" (emphasis added) for improper Markush language. Proper Markush language is "R is selected from the group consisting of . . . and . . ." or "R is . . . or . . ." MPEP 2173.05(h). Applicants are using a combination of both phrases. Thus, it is not clear what is the scope of the instant claims.

8. Claims 37-39, 52, and 77-79 are objected to because of the following informalities:

In claims 37-39 and claims 77-79, the term "polar solvent" lacks antecedent basis in claims 36 and 76, from which claims 37-39 and claims 77-79, respectively, depend. Claims 36 and 76 recite the use of a "polar solvent medium" (emphasis added), not a polar solvent.

In claim 52, which depends from claim 40, the label "R" is used in both the formula of the vinyl-substituted tertiary arylamine monomer and in the of the vinyl-substituted silane monomer. The use of the same label can lead to confusion as to the identity of the R group.

Appropriate correction is required.

9. In the interest of compact prosecution, the examiner has interpreted the claim language in claims 14 and 52,"[a]

silsesquioxane comprising the polymer of claim 1 [claim 52: 40]," to refer to a silsesquioxane comprising the condensation reaction of the polymers recited in claims 1 and 40, respectively, from which claims 14 and 52 depend. The instant specification provides antecedent basis for the examiner's interpretation at page 6, lines 8-11, at page 10, lines 17-19, and in example 12 of the instant specification. Rejections based on this interpretation are set forth infra.

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f), or (g) prior art under 35 U.S.C. 103(a).

13. Claims 54, 55, 59-62, 64-73, 75-80, and 83-86 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,495,300 B1 (Qi).

Qi discloses an electrophotographic imaging element comprising an electrically conductive layer, a barrier layer, a charge generating layer, a charge transporting layer, and an overcoat layer comprising the crosslinked composite polysiloxane-silica generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with the organosilane compound 3-aminopropyltrimethoxysilane in a mixture of ethanol/water and silica particles. The overcoat layer has a layer thickness of about 5 microns. Example VI at cols. 22-23.

The polymer of formula (IV-a) comprises 0.02 mole fraction of the monomer 3-(trimethoxysilyl)propylmethacrylate and 0.10 mole fraction of the monomer comprising a hole transporting moiety, vinylcarbazole. See col. 5, lines 17-18, and example 1 at cols. 19-20. The imaging member layer structure meets the layer structure limitations recited in instant claims 54, 75, 80, 83, 84, and 86. The overcoat layer thickness of "about 5 microns" is within the layer thickness range of "about 1 micron to about 3 microns" (emphasis added) recited in instant claim 85. The term "about" admits variation. There is no disclosure in the instant specification of critical properties that exclude the Qi overcoat layer thickness of about 5 microns from the upper limit of "about 3 microns" of the layer thickness range recited in instant claim 85. Thus, the Qi layer thickness of about 5 microns is within the layer thickness range recited in instant claim 85. The method of preparing the crosslinked reaction product, i.e., condensed reaction product, of the silyl-functionalized hydroxyalkyl polymer meets the process limitations recited in instant in instant claims 76-78. The silyl-functionalized hydroxyalkyl polymer meets the polymer compositional limitations recited in instant claims 54, 55, 59, and 64-66. The 3-aminopropyltrimethoxysilane meets the optional silane monomer limitations recited in instant claims 54

and 67-71. Qi further discloses that the monomer 3-(trimethoxysilyl)propylmethacrylate may be present in mole fractions of from about 0.001 to about 0.5. Col. 15, lines 38-39. The upper limit, about 0.5 mole fraction, of the mole fraction of said 3-(trimethoxy-silyl)propylmethacrylate meets the ranges recited in instant claims 60-62. Qi also discloses that the organosilane compound can equally be methyltrimethoxysilane, which meets the optional silane monomer limitations recited in instant claims 72 and 73. Col. 11, line 56.

Qi does not identify its overcoat layer as a charge transport layer as recited in the instant claims. However, for the reasons discussed above, the Qi overcoat layer meets the first charge transport layer compositional limitations recited in the instant claims. Thus, it is reasonable to conclude that the Qi overcoat layer has charge transporting properties. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

14. Claims 14, 16, 17, 22-25, and 27-39 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Qi, as evidenced by applicants'

admissions at page 40, lines 8-14, of the specification (applicants' admission I).

Qi discloses the crosslinked composite polysiloxane-silica generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of formula (IV-a) with the organosilane compound 3-aminopropyltrimethoxysilane in a mixture of ethanol/water and silica particles. The polymer of formula (IV-a) is obtained by reacting the monomer 3-(trimethoxysilyl)propylmethacrylate and the monomer comprising a hole transporting moiety, vinylcarbazole. The discussion of said crosslinked composite in paragraph 13 above is incorporated herein by reference.

Qi does not identify its crosslinked composite as a silsesquioxane as recited in the instant claims. However, the instant specification at page 40, lines 8-14, provides a structure of a silsesquioxane. The Qi crosslinked composite has the structure shown at col. 9, which is similar to that shown at page 40 of the instant specification. Accordingly, it is reasonable to presume that the Qi crosslinked composite is a silsesquioxane as recited in the instant claims. The burden is on applicants to prove otherwise. Fitzgerald, supra.

15. Claims 54-62, 64-80, and 83-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi combined with Tamura, as evidenced by Diamond, Handbook of Imaging Materials, p. 426, and Fig. 9.22 at page 430 (Diamond) and US 6,376,695 B1 (Kushibiki).

Qi discloses an electrophotographic imaging member as described in paragraph 13 above, which is incorporated herein by reference. The crosslinked composite polysiloxane-silica is generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with the organosilane in a mixture of ethanol/water and silica particles. The polymer of formula (IV-a) is obtained by reacting the silyl-containing monomer, 3-(trimethoxysilyl)propylmethacrylate, and the monomer comprising a hole transporting moiety, vinylcarbazole. The organosilane can be methyltrimethoxysilane, which meets applicants' elected species. 3-trimethoxysilyl)propyl-methacrylate meets applicants' elected species, methacryloxypropyltrimethoxysilane (MATMS).

Qi does not exemplify a silyl-functionalized hydroxylalkyl polymer obtained from the monomer di-p-anisylamino styrene (DAAS), applicants' elected species. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68.

According to Qi, the electrophotographic imaging member comprising an overcoat layer comprising the crosslinked composite polysiloxane-silica provides satisfactory imaging performance and has excellent mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

Tamura discloses the monomer di-p-anisylamino styrene, which is representative of the Tamura formula (III). See Tamura, col. 3, lines 20-45, and col. 28, compound no. 124. Di-p-anisylamino styrene meets applicants' elected species. The monomer di-p-anisylamino styrene also meets the monomer limitations recited in instant claims 57 and 58 and the tertiary arylamine charge transport moiety limitation recited in instant claim 74. See the chemical formula CTM I in claim 74. Tamura does not identify the di-p-anisylamino styrene as a monomer comprising a hole transporting moiety. However, it is well known in the art of electrophotography that triarylamines are hole transporting compounds. See Diamond, page 428, lines 26-29, and Fig. 9.22 at page 430. According to Tamura, polymerizable carbon-carbon double-bond-containing monomers of the formula (III) have a triphenylamine skeleton, which is "regarded as a hopping site of a charge carrier, so that they

have excellent charge carrier transporting characteristics." Col. 3, lines 46-50.

Tamura also does not disclose that the di-p-anisylamino-phenyl moiety of the monomer has an oxidation potential as recited in instant claim 56. However, as discussed above, the di-p-anisylamino phenyl moiety meets the compositional limitations recited in instant claim 74. Kushibiki discloses that di-p-anisylamino benzene has an oxidation potential of 0.72 volts, which is within the range of about 0.6 to about 1.2 volts recited in instant claim 56. Kushibiki, col. 21, lines 15-20. Kushibiki does not disclose that the oxidation potential is "versus a standard calomel electrode" as recited in instant claim 56. Thus, because the di-p-anisylamino phenyl moiety meets the tertiary arylamine compositional limitations recited in claim 74 and because it has an oxidation potential value that is within the potential range recited in instant claim 56, it is reasonable to presume that the di-p-anisylamino phenyl moiety in the Tamara di-p-anisylamino styrene monomer has an oxidation potential as recited in instant claim 56. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura di-p-

anisylamino styrene as the monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer in the imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining an electrophotographic imaging member that has the benefits disclosed by Qi and that has improved charge transporting characteristics as disclosed by Tamura.

16. Claims 56-62, 64-80, and 83-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi combined with Tamura, as evidenced by Diamond and Kushibiki.

Qi discloses an electrophotographic imaging member as described in paragraph 13 above, which is incorporated herein by reference. The crosslinked composite polysiloxane-silica is generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with the organosilane in a mixture of ethanol/water and silica particles. The polymer of formula (IV-a) is obtained by reacting the monomer, 3-(trimethoxysilyl)propylmethacrylate, and the monomer comprising a hole transporting moiety, vinylcarbazole.

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from a monomer comprising a tertiary arylamine

charge transport moiety as recited in instant claims 57, 58, and 74. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68. Qi teaches that the vinyl-containing monomer can be a monomer comprising an ester group. Col. 6, line 60. According to Qi, the electrophotographic imaging member comprising an overcoat layer comprising the crosslinked composite polysiloxane-silica provides satisfactory imaging performance and has excellent mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

Tamura discloses (meth)acrylate monomers comprising a triphenylamino moiety, which meet the monomer limitations recited in instant claims 57, 58, and 74. See Tamura, formula (I) at col. 3, lines 5 and 24-39, and, for example, compound nos. 1, 3, 4, 11, 14, 19, 20, 23, and 24. Tamura does not identify said (meth)acrylate monomers as monomers comprising a hole transporting moiety. However, it is well known in the art of electrophotography that triarylamines are hole transporting compounds. See Diamond, page 428, lines 26-29, and Fig. 9.22 at page 430. According to Tamura, polymerizable carbon-carbon double-bond-containing monomers of the formula (I)

have a triphenylamine skeleton, which is "regarded as a hopping site of a charge carrier, so that they have excellent charge carrier transporting characteristics." Col. 3, lines 46-50.

Tamura also does not disclose that the triphenylamino moieties of the (meth)acrylate monomers have an oxidation potential as recited in instant claim 56. However, as discussed above, the triphenylamino moieties meet the compositional limitations recited in instant claim 74. Kushibiki discloses that triphenylamino moiety in Tamura compound nos. 1, 3, 4, 11, 14, 19, 20, 23, and 24 has an oxidation potential of 0.86 volts, which is within the range of about 0.6 to about 1.2 volts recited in instant claim 56. Kushibiki, col. 14, lines 25-35. Kushibiki does not disclose that the oxidation potential is "versus a standard calomel electrode" as recited in instant claim 56. Thus, because the triphenylamino moiety in Tamura compound nos. 1, 3, 4, 11, 14, 19, 20, 23, and 24 meets the tertiary arylamine compositional limitations recited in claim 74 and because it has an oxidation potential value that is within the potential range recited in instant claim 56, it is reasonable to presume that the triphenylamino moiety in the Tamara compounds nos. 1, 3, 4, 11, 14, 19, 20, 23, and 24 has an oxidation potential as recited in instant claim 56. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura (meth)acrylate monomer comprising a triphenylamine moiety as the monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer of the imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining an electrophotographic imaging member that has the benefits disclosed by Qi and that has improved charge transporting characteristics as disclosed by Tamura.

17. Claims 14, 16-25, 27-39, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi, as evidenced by applicants' admissions I, combined with Tamura, as evidenced by Diamond and Kushibiki.

Qi discloses a crosslinked composite polysiloxane-silica generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with the organosilane in a mixture of ethanol/water and silica particles as described in paragraph 14 above, which is incorporated herein by reference. For the reasons discussed in paragraph 14 above, the Qi

crosslinked composite is a silsesquioxane as recited in the instant claims. The polymer of formula (IV-a) is obtained by reacting the monomer 3-(trimethoxysilyl)propylmethacrylate and the monomer comprising a hole transporting moiety, vinylcarbazole. The organosilane can be methyltrimethoxysilane, which meets applicants' elected species. 3-trimethoxysilyl)-propylmethacrylate meets applicants' elected species, methacryloxypropyltrimethoxysilane (MATMS).

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from the monomer di-p-anisylamino styrene (DAAS), applicants' elected species. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68. According to Qi, when the electrophotographic imaging member comprises an overcoat layer comprising the crosslinked composite polysiloxane-silica, the imaging member provides satisfactory imaging performance and has excellent mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

Tamura discloses the monomer di-p-anisylamino styrene, which is representative of the Tamura formula (III). Di-p-anisylamino styrene meets applicants' elected species. The

discussions of Tamura, Diamond, and Kushibiki in paragraph 15 above are incorporated herein by reference. Di-p-anisylamino styrene also meets the monomer limitations recited in instant claims 14, 19-21 and 52. See the chemical formula CTM I in claim 19.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura di-p-anisylamino styrene as the monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer in the imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining an crosslinked composite polysiloxane-silica that has excellent adhesion to a charge transport layer as disclosed by Qi and improved charge transporting characteristics as disclosed by Tamura; and an electrophotographic imaging member having the benefits disclosed by Qi and Tamura.

18. Claims 14, 16-25, 27-39 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi, as evidenced by

applicants' admissions I, combined with Tamura, as evidenced by Diamond and Kushibiki.

Qi discloses a crosslinked composite polysiloxane-silica generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with the organosilane in a mixture of ethanol/water and silica particles as described in paragraph 14 above, which is incorporated herein by reference. For the reasons discussed in paragraph 14 above, the Qi crosslinked composite is a silsesquioxane as recited in the instant claims. The polymer of formula (IV-a) is obtained by reacting the monomer 3-(trimethoxysilyl)propylmethacrylate and the monomer comprising a hole transporting moiety, vinylcarbazole.

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from a monomer comprising a tertiary arylamine as recited in instant claims 19-21 and 52. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68. Qi teaches that the vinyl-containing monomer can be a monomer comprising an ester group. Col. 6, line 60. According to Qi, the electrophotographic imaging member comprising an overcoat layer comprising the crosslinked composite polysiloxane-silica provides satisfactory imaging performance and has excellent

mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

Tamura discloses the (meth)acrylate monomers comprising a triphenylamino moiety, which meet the monomer limitations recited in instant claims 14, 19-21, and 52. The discussions of Tamura, Diamond, and Kushibiki in paragraph 16 above are incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura (meth)acrylate monomer comprising a triphenylamine moiety as the monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer in the imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining an crosslinked polysiloxane-silica composite that has excellent adhesion with a charge transport layer as disclosed by Qi and improved charge transporting characteristics as disclosed by Tamura; and an electrophotographic imaging member having the benefits disclosed by Qi and Tamura.

19. Claims 14, 16-21, 23-25, 27-29, 36-39, and 52 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2001/0017155 A1 (Bellmann), as evidenced by Kushibiki and as evidenced by applicants' admissions II at page 22, lines 12-14 and 25-26, of the instant specification.

Bellmann discloses a crosslinked hole transporting polymer, which obtained by reacting the monomer 4(m-tolylphenylamino)-4'-(m-tolyl-p-vinylphenylamino)biphenyl and the monomer trimethoxyvinylsilane. Page 5, paragraph [0035], poly(vinyl-TPD)=P2; paragraphs [0038], [0074], [0095]-[0096], [0103] to [0107]. The polymer contains 1-15% of trimethoxyvinylsilane. The monomer 4(m-tolylphenylamino)-4'-(m-tolyl-p-vinylphenylamino)biphenyl meets the monomer containing a tertiary arylamine charge transport moiety limitations recited in instant claims 14, 16, 19-21, 28, and 52. The monomer trimethoxyvinylsilane meets the monomer comprising a silicon-containing moiety limitations recited in instant claims 14, 16, 17, 27-29, and 52.

Bellmann does not disclose that the 4(m-tolylphenylamino)-4'-(m-tolylphenylamino)biphenyl moiety of the monomer has an oxidation potential as recited in instant claim 18. However, as discussed above, the 4(m-tolylphenylamino)-4'-(m-

tolylphenylamino)biphenyl moiety meets the compositional limitations recited in instant claim 19. See formula CTM VI recited in claim 19. Kushibiki discloses that 4(m-tolyl-phenylamino)-4'-(m-tolylphenylamino)biphenylene has an oxidation potential of 0.76 volts, which is within the range of about 0.6 to about 1.2 volts recited in instant claim 18. See Kushibiki, col. 14, lines 40-50. Kushibiki does not disclose that the oxidation potential is "versus a standard calomel electrode" as recited in instant claim 56. Thus, because the 4(m-tolylphenylamino)-4'-(m-tolylphenylamino)biphenyl moiety meets the tertiary arylamine compositional limitations recited in claim 19 and because it has an oxidation potential value that is within the potential range recited in instant claim 19, it is reasonable to presume that the 4(m-tolylphenylamino)-4'-(m-tolylphenylamino)biphenyl moiety in the Bellmann monomer has an oxidation potential as recited in instant claim 18. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Bellmann does not identify its crosslinked polymer as a silsesquioxane as recited in the instant claims. However, Bellmann teaches that that the trimethoxysilyl groups in the polymer cross-link on hydrolysis to form -Si-O-Si- bonds. Paragraph [0038]. Bellman further discloses that the polymer was "crosslinked by a simple procedure, which did not require

addition of other reagents or removal of byproducts." Paragraph [0074]. The instant specification at page 22, lines 12-14, discloses that the polymer of the invention can be used in preparing a silsesquioxane composition by hydrolysis and condensation of the reactive silane groups incorporated therein. The instant specification at page 22, lines 25-26, further discloses that the polymer of the invention can be used to prepare a silsesquioxane by itself and without reacting the polymer with another silane compound. Accordingly, because the Bellmann polymer meets the polymeric compositional limitations recited in the instant claims and because the cross-linked Bellmann polymer forms -Si-O-Si- bonds, it is reasonable to presume that the Bellmann crosslinked polymer is a silsesquioxane as recited in the instant claims. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Instant claims 36-39 are written in product-by-process format. Bellmann does not disclose that its crosslinked hole transporting polymer is prepared in a polymer solvent medium as recited in instant claims 36-39. However, as discussed above, the Bellmann crosslinked hole transporting polymer meets the compositional limitations recited in instant claims 36-39. Thus, the Bellman crosslinked hole transporting polymer appears to be the same or substantially the same as the silsesquioxane recited

in instant claims 36-39 prepared in the polar solvent medium recited those claims. The burden is on applicants to prove otherwise. In re Marosi, 218 USPQ 289 (Fed. Cir. 1983); In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985); MPEP 2113.

20. Claims 81 and 82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not teach or suggest the electrophotographic element recited in claims 81 and 82. Qi does not teach or suggest that its charge transport layer in the electrophotographic imaging member, which is located between the charge generating layer and the overcoat layer, can comprise the Qi crosslinked composite polysiloxane-silica or the Qi silyl-functionalized hydroxyalkyl polymer.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The central fax phone number is (571) 273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLD
Jan. 5, 2006

JANIS L. DOTE
PRIMARY EXAMINER
GROUP ~~1500~~ 1700